This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (currently amended) A data management method, comprising:

using an operating system, operating a source volume of a source device wherein the source volume includes storage, a plurality of user files stored in said storage and a file system for locating said user files stored in said storage, said file system including an address table identifying the location of each file on said storage device, said operating including said operating system locating said user files in said storage using said file system and said address table of said file system;

backing up contents of the source volume of the source device at a first client station as at least one object of a database stored in a data storage subsystem wherein the at least one object represents an image of the contents of the source volume of the source device;

using the database, tracking attributes and location of the at least one object in the database;

using the at least one object, restoring the contents of the source volume of the source device from the at least one object to at least one record of a target file in a file system stored on a storage device instead of to a volume being operated as a volume by an operating system so that the at least one record of the target file contains internally within said at least one record of said target file, image data representing said contents of the source volume including image data representing both said plurality of files and said file system of the source volume within said at least one record of said target file ;

using an operating system, using the target file containing the image data as a temporary repository for the contents of the source volume including the file system of the source volume, in which the target file has not been mounted to permit using the file

24 system contained within the target file ~~file instead of a volume so that the target file is not~~

25 ~~operated as a volume by an operating system;~~

26   copying image data representing the contents of the source volume from the at

27 least one record of the target file to a target volume of a target device so that the target

28 volume contains the restored contents of the source volume including said plurality of

29 files of the source volume and said file system of the source volume; and

30   using an operating system, operating the target volume as a volume, including

31 locating said user files in said target volume using said file system of said target volume

32 ~~so that the target volume is operated as a volume instead of a file by an operating system.~~

1   2. (previously presented)   The method of claim 1 wherein the target file is stored

2 on storage media at a second client station.

1   3. (previously presented)   The method of claim 1 wherein the target file is a flat

2 file which contains in a single record of the flat file the image data representing the

3 complete contents of the source volume.

1   4. (cancelled)

1   5. (original)   The method of claim 1 wherein the data storage subsystem includes

2 a server coupled to the first client station by a network.

1   6. (original)   The method of claim 1 further comprising, using the at least one

2 object, restoring the contents of the source device from the at least one object to a target

3 device so that the target device contains the contents of the source device.

1   7-9. (cancelled)

1   10. (original) The method of claim 1 further comprising mounting the source

2 device as a read only device wherein write operations to said source device are prevented

3 during said backing up of said source device.

1   11. (previously presented) The method of claim 1 wherein said target file is a flat

2 file.

1   12. (original) The method of claim 1 wherein said copying uses the UNIX dd

2 command.

1   13-36. (cancelled)

1   37. (currently amended) An article of manufacture for data management,

2 comprising at least one of hardware and a combination of hardware and software, said at

3 least one including machine readable instructions stored on the hardware that when

4 executed, causes the machine to perform operations ~~wherein the article of manufacture~~

5 ~~causes operations to be performed~~, the operations comprising:

6   using an operating system, operating a source volume of a source device wherein

7 the source volume includes storage, a plurality of user files stored in said storage and a

8 file system for locating said user files stored in said storage, said file system including an

9 address table identifying the location of each file on said storage device, said operating

10 including said operating system locating said user files in said storage using said file

11 system and said address table of said file system;

12   backing up contents of the source volume of the source device at a first client

13 station as at least one object of a database stored in a data storage subsystem wherein the

14 at least one object represents an image of the contents of the source volume of the source

15 device;

16   using the database, tracking attributes and location of the at least one object in the

17   database;

18   using the at least one object, restoring the contents of the source volume of the

19   source device from the at least one object to at least one record of a target file in a file

20   system stored on a storage device instead of to a volume being operated as a volume by

21   an operating system so that the at least one record of the target file contains internally

22   within said target file, image data representing said contents of the source volume

23   including image data representing both said plurality of files and said file system of the

24   source volume within said at least one record of said target file;

25   using an operating system, using the target file as a <u>temporary repository for the</u>

26   <u>contents of the source volume including the file system of the source volume, in which</u>

27   <u>the target file has not been mounted to permit using the file system contained within the</u>

28   <u>target file</u> ~~file instead of a volume so that the target file is not operated as a volume by an~~

29   ~~operating system~~;

30   copying image data representing the contents of the source volume from the at

31   least one record of the target file to a target volume of a target device so that the target

32   volume contains the restored contents of the source volume including said plurality of

33   files of the source volume and said file system of the source volume; and

34   using an operating system, operating the target volume as a volume, including

35   using said operating system, locating said user files in said target volume using said file

36   system of said target volume ~~so that the target volume is operated as a volume instead of~~

37   ~~a file by an operating system~~.

1   38. (previously presented)   The article of manufacture of claim 37 wherein the

2   target file is stored on storage media at a second client station.

1   39. (previously presented)   The article of manufacture of claim 37 wherein the
2   target file is a flat file which contains in a single record of the flat file the image data
3   representing the complete contents of the source device.

1   40. (previously presented)   The article of manufacture of claim 37 wherein the
2   data storage subsystem includes a server coupled to the first client station by a network.

1   41. (previously presented)   The article of manufacture of claim 37 wherein the
2   operations further comprise:
3   using the at least one object, restoring the contents of the source device from the at
4   least one object to a target device so that the target device contains the contents of the
5   source device.

1   42-44. (cancelled)

1   45. (previously presented)   The article of manufacture of claim 37 wherein the
2   operations further comprise:
3   mounting the source device as a read only device wherein write operations to said
4   source device are prevented during said backing up of said source device.

1   46. (previously presented)   The article of manufacture of claim 37 wherein said
2   target file is a flat file.

1   47. (previously presented)   The article of manufacture of claim 37 wherein said
2   copying uses the UNIX dd command.

1   48. (currently amended) A subsystem for managing data for use with a plurality
2   of client stations coupled together by a network, said client stations including a source

3   client station having a source device and a target client station having a target device,

4   each source device having a source volume which includes storage, a plurality of user

5   files stored in said storage and a file system for locating said user files stored in said

6   storage, said file system including an address table identifying the location of each file on

7   said storage device , comprising:

8   a data storage device having a database comprising a plurality of objects;

9   a digital data processing apparatus coupled to the storage device, wherein the

10   digital data processing apparatus includes an operating system and is programmed to

11   perform data management operations, said operations comprising:

12   using the operating system, operating a source volume of a source device

13   including said operating system locating said user files in said storage using said

14   file system and said address table of said file system;

15   backing up contents of the source volume of the source device at a source

16   client station as at least one object of said database stored in said data storage

17   device wherein the at least one object represents an image of the contents of the

18   source volume of the source device;

19   using the database, tracking attributes and location of the at least one

20   object in the database;

21   using the at least one object, restoring the contents of the source volume of

22   the source device from the at least one object to at least one record of a target file

23   in said file system stored on a target device of a target client station instead of to a

24   volume being operated as a volume by an operating system so that the target file

25   contains internally within said at least one record of said target file, image data

26   representing said contents of the source volume including image data representing

27   both said plurality of files and said file system of the source volume within said at

28   least one record of said target file;

29   using an operating system, using the target file as a <u>temporary repository</u>

30   <u>for the contents of the source volume including the file system of the source</u>

31   volume, in which the target file has not been mounted to permit using the file

32   system contained within the target file ~~file instead of a volume so that the target~~

33   ~~file is not operated as a volume by an operating system~~;

34   copying image data representing the contents of the source volume from

35   the at least one record of the target file to a target volume of a target device of a

36   target client station so that the target volume contains the restored contents of the

37   source volume including said plurality of files of the source volume and said file

38   system of the source volume; and

39   using an operating system, operating the target volume as a volume,

40   including using said operating system, locating said user files in said target

41   volume using said file system of said target volume ~~so that the target volume is~~

42   ~~operated as a volume instead of a file by an operating system~~.

1   49. (previously presented)   The subsystem of claim 48 wherein the target file is

2   stored on a target device of a target client station different from said source client station.

1   50. (previously presented)   The subsystem of claim 48 wherein the target file is a

2   flat file which contains in a single record of the flat file the image data representing the

3   complete contents of the source volume.

1   51. (previously presented)   The subsystem of claim 48 wherein the digital data

2   processing apparatus includes a server coupled to the first client station by said network.

1   52. (previously presented)   The subsystem of claim 48 wherein said operations

2   further comprise:

3   further comprising, using the at least one object, restoring the contents of the

4   source device from the at least one object to a target device so that the target device

5   contains the contents of the source device.

1   53-55. (cancelled)

1   56. (previously presented)   The subsystem of claim 48 wherein said operations
2 further comprise:
3   mounting the source device as a read only device wherein write operations to said
4 source device are prevented during said backing up of said source device.

1   57. (previously presented)   The subsystem of claim 48 wherein said target file is a
2 flat file.

1   58. (previously presented)   The subsystem of claim 48 wherein said copying uses
2 the UNIX dd command.

1   59. (currently amended) A data management method, comprising:
2   using an operating system, operating a source volume of a source device wherein
3 the source volume includes storage, a plurality of user files stored in said storage and a
4 file system for locating said user files stored in said storage, said file system including an
5 address table identifying the location of each file on said storage device, said operating
6 including said operating system locating said user files in said storage using said file
7 system and said address table of said file system;
8   mounting the source device as a read only device wherein write operations to said
9 source device are prevented during backing up of said source device;
10   backing up the complete contents of the source volume of the source device at a
11 first client station as at least one object of a database stored in a data storage subsystem
12 which includes a server coupled to the first client station by a network wherein the at
13 least one object represents an image of the contents of the source volume of the source
14 device;

15   using the database, tracking attributes and location of the at least one object in the

16   database;

17   determining that a target device is not available;

18   in response to said determination that said target device is not available, using the

19   at least one object, restoring the contents of the source volume of the source device from

20   the at least one object to a single record of a flat target file in a file system stored on a

21   storage device at a second client station instead of to a volume being operated as a

22   volume by an operating system so that the single record of the flat target file contains

23   internally within said single record of the flat target file, image data representing said

24   complete contents of the source volume including image data representing both said

25   plurality of files and said file system of the source volume within the contents of the

26   single record of the flat target file;

27   using an operating system, using the flat target file as a <u>temporary repository for</u>

28   <u>the contents of the source volume including the file system of the source volume, in</u>

29   <u>which the flat target file has not been mounted to permit using the file system contained</u>

30   <u>within the flat target file</u> ~~file instead of a volume so that the flat target file is not operated~~

31   ~~as a volume by an operating system~~;

32   copying image data representing the complete contents of the source volume from

33   the single record of the flat target file using the UNIX dd command to a target volume of

34   said target device when available so that the target volume contains the complete restored

35   contents of the source volume including said plurality of files of the source volume and

36   said file system of the source volume; and

37   using an operating system, operating the target volume as a volume, including

38   using said operating system, locating said user files in said target volume using said file

39   system of said target volume ~~so that the target volume is operated as a volume instead of~~

40   ~~a file by an operating system~~.